

REMARKS

The Office Action dated January 1, 2006 has been carefully considered. Claims 8, 9, and 14 are in this application.

The previously presented claims 8, 9, 14 and 15 were rejected under 35 U.S.C. § 103 as obvious in view of previously cited admitted prior art shown in Fig. 1 and as described on page 1, line 15 through page 5 line 29 of the present specification in combination with U.S. Patent No. 4,769,998 to Oswalt et al. Applicants submit that the teachings of these references do not teach or suggest the invention defined by the present claims.

According to the admitted prior art, as shown on page 3, lines 19-25, steam (gas) is supplied to an evaporator to gasify liquefied propylene by using its high energy. By this heat exchange, steam is condensed into warm water, which is only re-used for generating steam. In this case, the temperature of the warm water formed by heat exchange is too high to be used as coolant for a heat exchanger used in the production of acrylic acid, unlike the present invention.

Further, as shown on page 3, line 26 to page 4, line 12 the admitted prior art has various disadvantages. In particular, since steam has unduly high energy, even a slight change of steam pressure or amount of supplied steam can change the amount of propylene gasified, decreasing stability for production of acrylic acid using the propylene gas.

In contrast, according to the present invention, a liquid coolant is supplied to an evaporator for gasifying liquefied propylene. Since the liquid coolant has lower energy than steam, the total system for producing acrylic acid can be substantially stabilized as compared to the admitted prior art using steam. By this stabilization of the system, the present invention provides the advantage that the polymerization of acrylic acid can be prevented. As described in the present specification, an apparatus for producing acrylic acid can be operated stably without any suspension (see Examples 1 and 2).

Further, according to the present invention, the coolant which has been cooled with latent heat generated by the gasification of liquefied propylene can be circulated in various heat exchangers required for producing acrylic acid. This feature provides the advantages of being more economical in terms of mass production as described in the comparison between Examples and Comparative Examples in the present invention.


Oswalt et al. or Applicants' admitted prior art do not teach or suggest that a liquid coolant is used for gasifying liquefied propylene as defined by the present claims. Rather, in the apparatus of

the admitted prior art, although there is provided the means for adjusting pressure 24, the evaporator 3 is heated by the steam 17. Further, Oswalt et al. do not teach or suggest chilling a coolant by recovering latent heat of the liquefied propylene and/or propane. Furthermore, there is no teaching or suggestion in the combination of the Applicants' admitted prior art or Oswalt et al. that latent heat of the liquefied propylene and/or propane can be used for chilling a coolant. In addition, there is no teaching or suggestion in the combination of the Applicants' admitted prior art or Oswalt et al. of means for adjusting pressure of the evaporator for gasifying liquefied propylene and/or propane in the range of about 0.2 to about 2 MPa in gauge pressure. Accordingly, the invention defined by the present claims is not obvious in view of Applicants' admitted prior art in combination with Oswalt et al.

In view of the foregoing, Applicants submit that all pending claims are in condition for allowance and request that all claims be allowed. The Examiner is invited to contact the undersigned should she believe that this would expedite prosecution of this application. It is believed that no fee is required. The Commissioner is authorized to charge any deficiency or credit any overpayment to Deposit Account No. 13-2165.

Respectfully submitted,

Dated: April 19, 2006



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